In the Claims

1. (previously presented) A process in which a first hydroxyl-substituted organic compound selected from the formulae R^1CH_2OH, R^1R^2CHOH and $R^1R^2R^3COH$ is exposed, optionally in the presence of one or more further organic compounds selected from second hydroxyl-substituted organic compounds of the formulae R^4CH_2OH, R^5R^6CHOH, and $R^7R^8R^9COH$ and carbonyl compounds of the formula $R^{10}R^{11}CO$, to a heterogeneous catalyst which is able to provide a source of acid in a continuous flow reactor under supercritical conditions or at near-critical conditions for the fluid that is acting as solvent, with the result that an ether is formed from two hydroxyl-substituted organic compound molecules in a dehydration reaction, an acetal or ketal is formed by reaction between a hydroxyl-substituted organic compound molecule and a molecule of a said carbonyl compound, or an alkene product is produced by dehydration of a single hydroxyl-substituted organic compound molecule, wherein the conditions of temperature, pressure, and flow rate are controlled according to the product to be obtained, and wherein each of R^1 to R^{11} is independently selected from: hydrogen or hydroxyl; an optionally substituted alkyl, alkenyl, alkynyl, aralkyl, cycloalkyl, cycloalkenyl, or aryl; or a heterocyclic group.

2. (Original) A process according to claim 1, wherein each of R^1 to R^{11} when present is an optionally substituted alkyl group.

3. (Original) A process according to claim 2, wherein each of the alkyl groups independently contains not more than 10 carbon atoms in the carbon chain (excluding optional substituents if present).

4. (Previously presented) A process according to claim 1, wherein the total number of alcohol groups within the first organic compound does not exceed three.

5. (Previously presented) A process according to claim 1, wherein the reaction is performed under supercritical conditions.

6. (Previously presented) A process according to claim 1, wherein the first organic compound of formula R^1CH^2OH, R^1R^2CHOH, or $R^1R^2R^3COH$, and optionally one or more of the second compounds of formulae R^4CH_2OH, R^5R^6CHOH, $R^7R^8R^9COH$, or $R^{10}R^{11}CO$, is dissolved in a fluid selected from: carbon dioxide, propane, an alkene, an alkyne, hydrocarbon, halocarbon, nitrogen, or a mixture of any of these.

7. (Previously presented) A process according to claim 1, wherein the first organic compound is the supercritical or near-critical fluid.

8. (Previously presented) A process according to claim 1, wherein the catalyst is selected from: zeolites, metal oxides, molecular sieves, clays, or sulfonic acid derivatives.

9. (Original) A process according to claim 8, wherein the catalyst is supported on an inert carrier.

10. (Previously presented) A process according to claim 8, wherein the catalyst includes a promoter.

11. (Previously presented) A process according to claim 8, wherein the source of acid of the catalyst is provided by a sulfonic acid group.

12. (Previously presented) A process according to claim 1, wherein the first and second hydroxyl-substituted organic compounds are aliphatic and/or aromatic alcohols.

13. (Previously presented) A process according to claim 1, in which the product to be obtained is an ether.

14. (Previously presented) A process according to claim 13, in which the reactant(s) and the product to be obtained are straight-chain n-alkyl molecules.

15. (Previously presented) A process according to claim 11, wherein an aliphatic alcohol is converted into an alkene.

16. (Previously presented) A process according to claim 1, in which the reactant(s) is(are) from a single homogeneous phase.

17. (Previously presented) A process according to claim 13, in which the product to be obtained is a mono-ether.

18. (Previously presented) A process according to claim 13, in which the product to be obtained is a di-ether.

19. (Previously presented) A process according to claim 1, wherein the first and second hydroxyl-substituted organic compounds are aliphatic and/or aromatic alcohols and the product to be obtained is an ether.

20. (Previously presented) A process according to claim 19, in which the product to be obtained is a mono-ether.

21. (Previously presented) A process according to claim 19, in which the product to be obtained is a di-ether.

22. (Previously presented) A process according to claim 1, wherein the first hydroxyl-substituted organic
compound is an aliphatic or aromatic diol and the product to be obtained is an ether.

23. (Previously presented) A process according to claim 22, in which the product to be obtained is a mono-ether.

24. (Previously presented) A process according to claim 22, in which the product to be obtained is a di-ether.

25. (Previously presented) A process according to claim 22, wherein the first hydroxyl-substituted organic compound is a non-gem diol.

26. (Previously presented) A process according to claim 25, in which the product to be obtained is a mono-ether.

27. (Previously presented) A process according to claim 25, in which the product to be obtained is a di-ether.

28. (Previously presented) A process according to claim 25, wherein the non-gem diol is 1,6-hexane diol.

29. (Previously presented) A process according to claim 28, in which the product to be obtained is a mono-ether.

30. (Previously presented) A process according to claim 28, in which the product to be formed is a di-ether.